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# Preparing for the Storm

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# Preparing for the storm

## By designing sustainable drainage, researchers find common ground

Two Kansas State University projects show that when the collaborations reign, the results pour in.

The projects are improving stormwater management systems by bringing together students and faculty in numerous disciplines: landscape architecture, engineering, biology and agronomy, among others.

One project re-envisions the university's Campus Creek as a living laboratory for green, sustainable stormwater management.

Another interdisciplinary project involves the Environmental Protection Agency's Campus RainWorks Challenge competition. This successful collaboration landed Kansas State University multiple national winners in the 2014 competition.

"It comes down to communication, which is key to collaboration," said Jessica Canfield, an assistant professor of landscape architecture who is involved in both projects. "Finding common ground is important for a successful project. We want to initiate these early cross-disciplinary dialogues because students will never escape them in their professional careers."

### Campus Creek

As part of the 2025 University Master Plan, students and faculty are improving Campus Creek. The creek runs through the Manhattan campus and receives most of the rainwater that falls on campus. It will serve as a research model for sustainable stormwater management methods.

The project uses sustainable improvements to make Campus Creek the core of campus, from education to recreation and research.

But there's another goal: to help students see interdisciplinary work as the core of successful research and application.

Canfield and Tim Keane, professor of landscape architecture, are combining their skills to lead the project. Keane's specialty is fluvial geomorphology and natural channel restoration, while Canfield is an expert in creating socially engaging, design-oriented landscapes.

Project collaborations include:

- Ryan McGrath, instructor of civil engineering, and graduate students are surveying the creek and creating elevation maps and hydrologic models.
- Landscape architects are creating vegetation maps that geo-locate trees and green space.
- Biological and agricultural engineers are analyzing water and soil samples with Philip Barnes, associate professor of biological and agricultural engineering.
- Campus planning and facilities management staff members, including Ryan Swanson, associate vice president, are helping the researchers address real design situations on campus.

Canfield and Keane will use the data when co-teaching more than 14 students in a fall semester course focused on restoring Campus Creek. Keane will help students develop a stable stream channel that floods less frequently. Canfield will guide student-designed creek improvements, such as new trails, outdoor classrooms, informal gathering spaces and additional vegetation.

Canfield and Keane see the project as a way to integrate different perspectives of engineers and landscape architects. While engineers often focus on efficiency, safety and numbers first — such as channel capacity or storage capacity — landscape architects often focus on visual aspects and ecological functions first.

"Engineers and landscape architects do similar things, but do them in different sequences," Keane said. "They can work independently, but when you put them together you get a much stronger product and a much more resilient stream system."

The project is receiving support from a university Green Action Fund, the provost's office and a university Academic Excellence Award. The landscape architecture program is dedicating a year of study to the creek as a gift to the university to celebrate the program's 50th anniversary.

### RainWorks Challenge

Engineers and landscape architects also are collaborating on stormwater projects through the Environmental Protection Agency's annual Campus RainWorks Challenge competition.

The challenge encourages students and faculty to increase green infrastructure on campuses. More than 50 teams nationwide participated in the 2014 competition and Kansas State University was the only university to have multiple winners.

A Kansas State University interdisciplinary team of students and faculty placed first in the site design category for re-envisioning the campus area south of Hale Library. Another university team took honorable mention for redesigning the area next to the Beach Museum of Art, adjacent to the Hummel Family Meadow.

The redesigned sites include sustainable aspects, such as stormwater gardens, wet meadows, drainage canals and vegetation that need no supplemental irrigation once established.

The projects were part of a third-year landscape architecture design course that Canfield and Lee Skabelund, associate professor of landscape architecture, taught.

"The project allowed students to explore pressing issues related to integrated stormwater management with the twin goals of improving water quality and ecological performance — while providing beautiful and diverse systems that are quite different from what has been the norm on campus," Skabelund said.

For the projects, landscape architecture students worked with faculty advisers and graduate students in biology, agronomy and environmental design to create sustainable stormwater management. They also received support and guidance from Mark Taussig, associate director of campus planning and facilities management. Each team included a civil engineering student advised by McGrath.

"It is good for the students to see that other people have priorities that might be completely different from their own," McGrath said. "Between communication and being able to compromise, the students learned to find common ground to move toward the solution."

*— By Jennifer Tidball, Division of Communications and Marketing*